

COUNTING ROOM TECHNICIAN JOB PERFORMANCE MEASURE

TASK CODE: CRT-D04

TASK: Calibrate the Tennelec LB4100 Gross Alpha/Beta Counting System

NAME: _____ **SSN:** _____

REFERENCES:

1. WP 12-RL1340, Operation of Tennelec LB4100 Gross Alpha/Beta Counting System
2. WP 12-RL1320, Radioactive Source Control

TERMINAL OBJECTIVE:

Given a Tennelec LB4100 Gross Alpha/Beta Counting System, calibrate the system per WP 12RL1340.

CONSEQUENCES OF INADEQUATE PERFORMANCE:

Improper sample analysis
Component damage

HAZARDS (PERSONNEL/EQUIPMENT STATUS):

None

PRE-REQUISITE TRAINING/ TASK COMPLETION:

1. CF 3.00 Series
2. CRT-D02, Perform Proportional Counter Preoperational Checks
3. CRT-D05, Perform Gross Alpha/Beta Analysis with a Proportional Counter

TOOLS/EQUIPMENT (MATERIALS REQUIRED):

1. Tennelec Gross Alpha/Beta Counting System
2. Radioactive Sources
3. System Logbook
4. Tweezers

Instructions to Trainee: You shall acquire the necessary references and equipment, and complete all required documentation. Knowledge requirements shall be completed with 80% or greater accuracy. Critical step performance shall be completed with 100% accuracy.

Instructions to JPM Evaluator: The trainee is to perform the terminal objective, without assistance, on the job site. Provide clarification of requirements if requested by the trainee. You are encouraged to ask relevant questions to verify trainee understanding. If the trainee fails this JPM, clearly document the reason for failure and forward to the trainee's manager. Successful completion of this JPM shall be recorded on the trainee's qualification card.

KNOWLEDGE REQUIREMENTS:

Reference	Knowledge Requirement	Pass/Fail
1	State the purpose of the Plateau.	
1	State the purpose of determining the Crosstalk Setting.	
1	State the purpose of determining the system Background.	
1	State the purpose of determining the system Efficiency.	
2	Discuss the precautions used when handling radioactive sources.	
1	Discuss how to manually determine the detector operating voltage.	
1	Define the term "Region of Interest". (ROI).	
1	Discuss why a separate efficiency must be determined for alpha and beta for each detector.	

PERFORMANCE REQUIREMENTS:

Reference	Performance Requirement	Pass/Fail
1	Plateau	
2	Obtain and checkout the required radioactive source.#	
1	Select options and perform the plateau.#	
1	Verify the computer selected high voltage setpoint is ± 50 volts of the distance from the knee of the curve to the end of the plateau when compared to manual calculation.#	
1	Generate, review and initial the printout report.#	

1	Document the completion in the system logbook.#	
Reference	Performance Requirement	Pass/Fail
1	Crosstalk Settings	
2	Obtain and checkout the required radioactive source.#	
1	Select options and set alpha and beta upper and lower limits.#	
1	When system has 30,000 counts, set beta to alpha crosstalk at 2.5%.#	
1	Create deadband by adjusting alpha lower limit until beta to alpha crosstalk is at 0.1%.#	
1	Verify alpha to beta crosstalk is between 8% and 20% when system has 30,000 counts.#	
1	Document the completion in the system logbook.#	
1	Background	
1	Select options and perform the background count.#	
1	Generate, review and initial the printout report.#	
1	Document the completion in the system logbook.#	
1	Detector Efficiency	
2	Obtain and checkout the required radioactive source.#	
1	Select options and perform an efficiency check for each detector with an alpha source.#	
1	Select options and perform an efficiency check for each detector with an beta source.#	
1	Generate, review and initial the printout report.#	
1	Document the completion in the system logbook.#	
2	Remove and checkin the radioactive sources.#	
1	Place Calibration Sticker on equipment if all calibrations meet the acceptance criteria.#	

indicates a critical step

FINAL EVALUATION:

PASS

FAIL

COMMENTS:

EVALUATOR SIGNATURE:

DATE:_____

TRAINEE SIGNATURE:

DATE:_____

MANAGER SIGNATURE:

DATE:_____